Reconciling Hayek’s and Keynes’ views of recessions

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Two views of recessions that are often presented as polar opposites.

1. Liquidation view, often associated with Hayek:
   - Over-accumulation $\rightarrow$ liquidation phase $\rightarrow$ recession (necessary evil).
   - Stimulating demand ill-advised; only postpones the problem.

2. Aggregate demand view, associated with Keynes:
   - Recessions inefficient: gains-from-trade not properly exploited.
   - Desirable to stimulate consumption/investment, as aggregate demand deficient.
We find both narratives compelling!
Motivates us to look for a framework in which we can make sense of both views, and examine policy tradeoffs within.

What we do:
1. Re-examine liquidation view in environment where trades not all coordinated through centralized market.

2. Ask: How does economy adjust when inheriting excess capital (houses, durable goods, productive capital)? Can agents be worse off? How should policy respond: laissez faire, or stimulus
   - Mainly take over-accumulation as given.
Related literature

- Many precursors in literature on strategic complementarities and aggregate demand externalities. Examples:
  - Newer literature: Guerrieri and Lorenzoni (2009), Angeletos and La’O (2009), and especially Heathcote and Perri (2013).

- Model also builds on elements in the money-search literature
  - Uses multi-agent household framework as in Lucas (1990) and Shi (1998)
  - Use alternating decentralized-centralized market setting as in Lagos-Wright (2005) and Rocheteau-Wright (2005)

- Precautionary saving related unemployment risk plays a central role
Basic two period model

**Sub-period 1**
- **Household** $U(c) - \nu(l)$
- **Worker**
- **Shopper**
- **Potential firms** $F(l), K$
- **Durable goods market** $(p)$
- **Random matching labor market** (bargain $l, w$)
- **Supply**
- **Search**

**Sub-period 2**
- **Household assets** $(a)$:
  - **Employed** $\frac{a = wl - pc > 0}{\phi}$
  - **Unemployed** $\frac{a = - pc < 0}{1 - \phi}$
- Value of assets $(V(a))$: $V'(a+) < V'(a-)$

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Preferences 1st sub-period: \( U(c) - v(l), \quad c = X + e \)

Preferences 2nd sub-period: \( V(a) = a \) if \( a > 0 \), \( V(a) = (1 + \tau)a \) if \( a < 0 \) (a is assets)

Technology
- Firms: \( F(l), \) \( l \) hours worked
- Matching: Min[ N,L], \( N \) number of firms, \( L \) number of workers
- Cost to set up: \( K \)

Basic timing: one period, two sub-periods.
Equilibrium conditions

- Shopper’s f.o.c.:

\[ U'(c) = p \left[ \min\{N, L\} \frac{V'(wl - p(c - X))}{L} \right. \]

\[ \left. + \left( 1 - \min\{N, L\} \right) V'(-p(c - X)) \right] \]

- Implications of efficient bargaining process:

\[ \nu'(l) = V'(wl - p(c - X))w \]

\[ pF'(l) = w \]

- Zero-profit condition for firms:

\[ \min\{N, L\}[pF(l) - wl] = pNK \]

- Clothes market-clearing condition:

\[ \min\{N, L\}F(l) = L(c - X) + NK \]
Existence and uniqueness of equilibrium

Proposition

There exists a $\bar{\tau} > 0$ such that:

(a) if $\tau < \bar{\tau}$, then there exists a unique equilibrium for any value of $X$;

(b) if $\tau > \bar{\tau}$, then there exists a range of $X$ for which there are multiple equilibria.

- Parameter $\tau$ governs strength of precautionary savings motive and therefore degree of strategic complementarity.

- As is often the case, if strategic complementarity is too strong multiple equilibria can arise.

- Focus on case where $\tau < \bar{\tau}$. 

### Proposition

There exists $X^*$ and $X^{**}$, with $X^* < X^{**}$, such that:

(a) if $X < X^*$, then $\phi = 1$ (full employment)

(b) if $X^* < X < X^{**}$, then $0 < \phi < 1$ (partial unemployment)

(c) if $X > X^{**}$, then $\phi = 0$ (zero employment)

- Endowment low $\rightarrow$ demand high $\rightarrow$ full employment.
- Endowment high $\rightarrow$ demand low $\rightarrow$ unemployment.
- Endowment very high $\rightarrow$ consume endowment $\rightarrow$ no employment.
Conditions now:

\[ U'(c) = \frac{\nu'(l)}{F''(l)} \]

\[ c = F'(l)l + X \]

\[ \frac{L}{N}[F(l) - F'(l)l] = K \]

\[ w = \frac{\nu'(l)}{v} \]

\[ p = \frac{\nu'(l)}{vF'(l)} \]

First equations solves for \( l \), second for \( c \), then \( N \), last two yield \( w \) and \( p \). Own consumption is a substitute for others.
Equilibrium conditions: unemployment regime (high $X$

- Conditions now:

$$U'(c) = \frac{\nu'(l)}{F'(l)} \left(1 + \tau - \tau \frac{N}{L}\right)$$

$$\frac{N}{L} = \frac{c - X}{F'(l)l}$$

$$[F(l) - F'(l)l] = K$$

$$w = \frac{\nu'(l)}{v}$$

$$p = \frac{\nu'(l)}{vF'(l)}$$

- Now third equation solves for $l$, the first two solve for $c$ and $N$; then last two yield $w$ and $p$. 
Labor wedge as function of $X$

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Equilibrium consumption and welfare

Proposition

Consumption is:

(a) increasing in $X$ if $X < X^*$ (full employment)
(b) decreasing in $X$ if $X^* < X < X^{**}$ (partial unemployment)
(c) increasing in $X$ if $X > X^{**}$ (zero employment)

Similar result for welfare if average cost of work low relative to marginal cost
Consumption as function of $X$
Why can consumption decrease with more X?

- $e^* \equiv F(l^*) - K$: net output per worker in unemployment regime.

- Key conditions:

\[
\frac{U'(X + e_j)}{v} = p \left[1 + \tau \left(1 - \min \left\{\frac{e}{e^*}, 1\right\}\right)\right]
\]

- Intertemporal MRS if employed
- Perceived cost of funds
Baseline: no cost of debt ($\tau = 0$)
Baseline: no cost of debt ($\tau = 0$)

\[ p^* \]

perceived cost of funds

\[ v^{-1}U'(X+e) \]
Baseline: no cost of debt ($\tau = 0$)

$$\nu^{-1} U'(X + e)$$
Baseline: costly debt ($\tau > 0$)

perceived cost of funds

$\leftarrow p^* \rightarrow$

$\leftarrow e^* \rightarrow$
Baseline: costly debt ($\tau > 0$)

Perceived cost of funds $\nu^{-1}U'(X+e)$

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Baseline: costly debt ($\tau > 0$)

Perceived cost of funds $\nu^{-1}U'(X+e)$

Multiplier

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Is there Deficient Demand?

Proposition

When the economy is in the unemployment regime (\(X^* < X < X^{**}\)), a coordinate increase in consumption/expenditures increases the expected utility of all households.

- Clear coordination problem.
- However, static framework does not allow to consider costs in terms of postponement.
Dynamic model

- Infinite sequence of periods, each with two sub-periods.

- Agents accumulate durables:

\[ X_{t+1} = (1 - \delta)X_t + \gamma e_t \]
\[ = (1 - \delta - \gamma)X_t + \gamma c_t \]

- \( \gamma \): fraction of new purchases that are durable (assume \(< 1 - \delta \)).

- Household’s objective function:

\[ \sum_{t=0}^{\infty} \beta^t \{ U(c_t) + \phi_t [ -\nu(l_t) + V(w_t l_t - p_t e_t)] + (1 - \phi_t) V(-p_t e_t) \} \]

- where \( \phi \) is probability of finding a job.
Proposition

If $\delta$ is sufficiently small, steady state is unique and in the unemployment regime.

- Low $\delta \Leftrightarrow$ high durability.
- Focus on this case.
Local dynamics

- Does $dc_t/dX_t < 0$ result extend around unemployment steady state?

**Proposition**

If $\tau$ is sufficiently small then in the neighborhood of an unemployment steady state, $dc_t/dX_t < 0$ and $X_t$ converges monotonically.

- Over-accumulation $\rightarrow$ low consumption during transition: liquidation period.

- Welfare: depends on similar factors as in static case, e.g., low average dis-utility of work.
Policy trade-offs

- Suppose economy has inherited high $X_0$.
  - No intervention $\rightarrow$ liquidation phase w/ low consumption.
- First-best policy: remove frictions/provide insurance, but may not be possible.
Explore alternative policy: Stimulate expenditures for one period, knowing this postpones problem.

- Higher $c_0$.
- Delay of liquidation process: higher $X_t$, lower $c_t$, $t \geq 1$.
- Could be accomplished in different ways (e.g., consumption subsidy financed by tax on employed).

Break question into two parts.

1. Would temporary stimulus increase welfare if begin from steady state ($X_0 = X_{SS}$)?
2. Would effect on welfare be greater if initially in liquidation state ($X_0 > X_{SS}$)?
**Proposition**

If the system exhibits local convergence and $X_0 = X_{SS}$ then a small temporary stimulus will enhance welfare.

- From envelope theorem, only need to consider changes in welfare through changes in $\phi$, which are proportional to $e$
  - Thus, change in welfare proportional to change in $\sum \beta^t e_t$.
  - Temporary stimulus $\rightarrow \sum \beta^t e_t \uparrow$. 

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Beginning from over-accumulated state

**Proposition**

If $X_0 > X_{SS}$ and $U'''$ is not too big then a small temporary stimulus will enhance welfare, but by no more than when $X_0 = X_{SS}$.

- Even if wedge is bigger, no larger gains.
- Again, only need to consider welfare effect of changes in $\phi$ (envelope theorem).
Conclusion/Summary

- Presented a simple environment where liquidations can create deficient aggregate.

- Mechanisms: precautionary savings associated with unemployment risk gives rise to multiplier process for “demand” shocks.

- Mechanism can explain why periods of liquidations often appear very painful and inefficient.
  - Links Hayekian and Keynesian views of recessions.

- Model helps discuss the intertemporal trade-off of stimulative policies.